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SID 62-205

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BOILERPLATE NUMBER 1 COMMAND MODULE LAND IMPACT TEST SPECIFICATION PROJECT APOLLO SPACECRAFT

(Unclassified)

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Approved by

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CONTENTS

CONTENTS (Cont.)

APPENDICES

ILLUSTRATIONS

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1. SCOPE

1.1 Scope. - This specification covers the requirements for the Command Module Land Impact Test Boilerplate. The Land Impact Test Boilerplate shall be used to test the earth impact attenuation system and crew shock absorption system of the command module.

2. APPLICABLE DOCUMENTS

2.1 General.- The following documents shall form a part of this specification:

Government Documents

Air Force

ARDCM, 80-1, Volume I	Handbook of Instructions for Aircraft Designers

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NCP 200-2	Quality Assurance Provisions for Space Contractors, dated 15 December 1961

Non-Government Documents

SPACE & INFORMATION SYSTEMS DIVISION, NORTH AMERICAN AVIATION, INC.

SID 62-240	Preparation for Delivery of Airborne Equipment, General Requirements For

3. REQUIREMENTS

3.1 General.- The configuration of the command module land impact test boilerplate shall be similar to the prototype command module configuration. The configuration of the command module land impact test boilerplate is shown in figure 1.

3.2 Components.-

3.2.1 Boilerplate Sections.- The command module land impact test boilerplate shall include a cabin section and a lower compartment.

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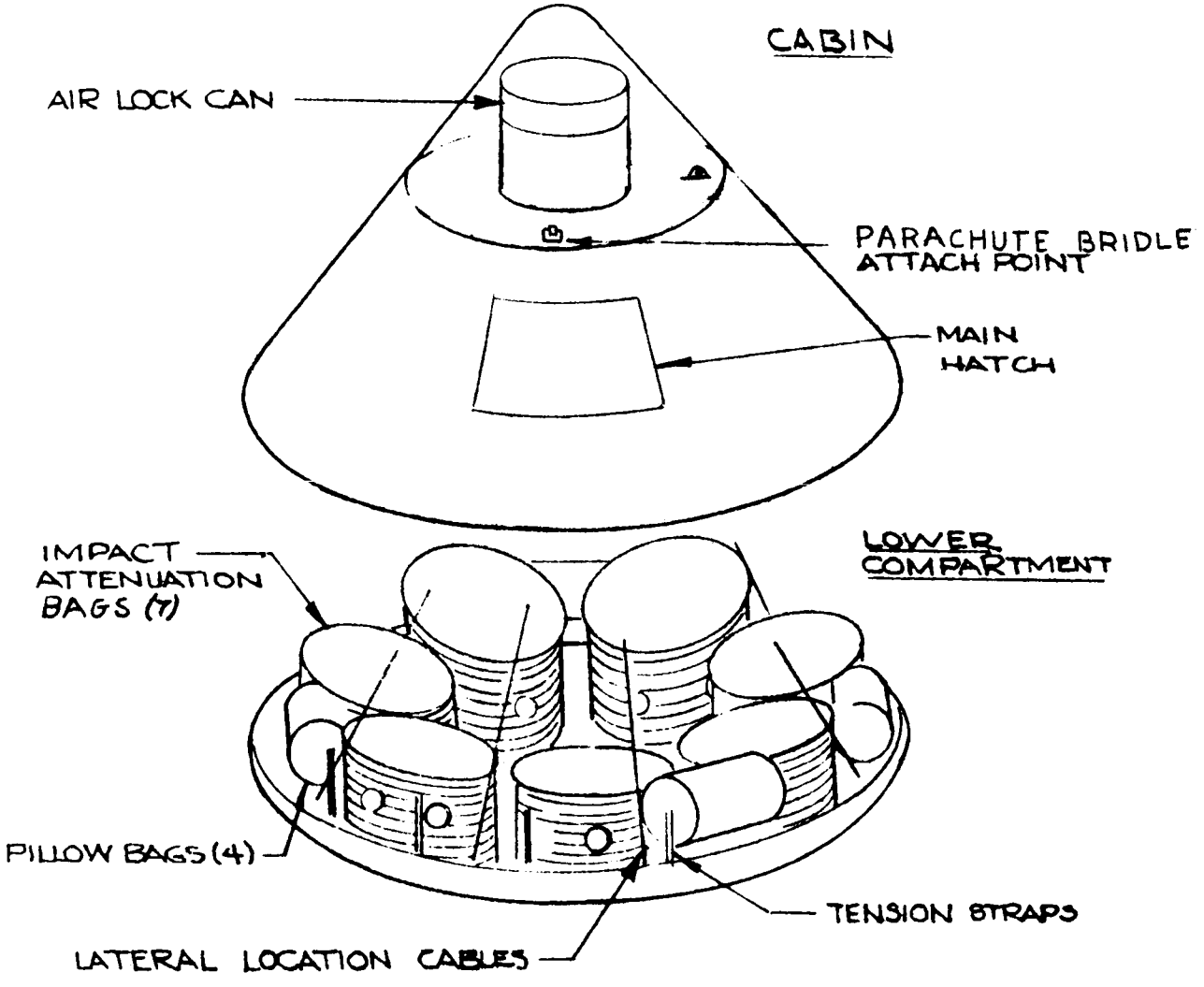

Figure 1. Boilerplate No. 1

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3.2.1.1 Cabin Section.- The cabin section of the boilerplate shall include the following:

(a) Cabin Housing

(b) Main Hatch

(c) Restraint and Support Equipment

(d) Anthropomorphic Dummies (With test instruments)

(e) On Board Instrumentation

(f) Parachute Bridle Attach Points

(g) Air Lock

3.2.1.1.1 Cabin Housing.- The cabin housing of the boilerplate shall be similar to the cabin housing of the prototype command module.

3.2.1.1.2 Main Hatch.- The main hatch shall provide ingress and egress for personnel.

3.2.1.1.3 Restraint and Support Equipment.- The restraint and support equipment for the dummies shall be similar to the crew restraint and support equipment of the prototype command module.

3.2.1.1.4 Anthropomorphic Dummies.- The anthropomorphic dummies used in the boilerplate shall be instrumented for use with testing equipment.

3.2.1.1.5 On Board Instrumentation.- The on board instrumentation in the boilerplate shall be as listed in Appendix I-A.

3.2.1.1.6 Parachute Bridle Attach Points.- Parachute bridle attach points shall be used to support the boilerplate in the test stand.

3.2.1.1.7 Air Lock.- The air lock of the command module shall be simulated in the cabin section of the boilerplate.

3.2.1.2 Lower Compartment. - The lower compartment or shock attenuator section of the boilerplate shall include the impact attenuation system, which includes:

(a) Seven impact attenuation bags

(b) Four pillow type impact attenuation bags

(c) Tension straps

3.2.1.2.1 Impact Attenuation Bags.- The boilerplate shall contain seven impact attenuation bags. The impact attenuation bags shall be located around the inside perimeter of the lower compartment as shown in figure 1.

3.2.1.2.2 Pillow Type Impact Attenuation Bags.- Four pillow type impact attenuation bags shall be installed in the lower compartment of the boilerplate. The arrangement of the bags shall be as shown in figure 1.

3.2.1.2.3 Tension Straps.- Tension straps shall be installed in the lower compartment of the boilerplate to aid in the support of the large attenuation bags.

3.3 Performance.-

3.3.1 General.- The land impact of the prototype command module shall be simulated in the test of the boilerplate. The boilerplate shall be capable of withstanding at least 15 test drops.

3.4 Design and Construction.-

3.4.1 General.- The boilerplate shall be constructed of the materials necessary to insure structural soundness. ARDCM-80-1, Volume 1, shall be used for guidance and reference material in the design and construction of the boilerplate.

3.4.2 Weight.- The boilerplate shall have a mass and center of gravity similar to the mass and center of gravity of the prototype command module.

3.4.2.1 Center of Gravity.- The center of gravity of the boilerplate shall be placed to give the boilerplate an impact angle of minus 15 degrees forward, when the crew is in the feet forward position.

3.4.3 Heat Shielding Simulation.- The boilerplate shall not contain heat shielding. The stiffness of the heat shielding of the command module shall be simulated in the boilerplate.

3.4.4 Attachment.- The cabin and lower compartment sections of the boilerplate shall be joined by restraining straps.

3.5 Ground Support Equipment.-

3.5.1 Ground Handling Equipment.- Ground handling equipment shall be required to transport, demonstrate and test the boilerplate. The requirements for ground handling equipment are in part of this specification.

4. QUALITY ASSURANCE PROVISIONS

4.1 General.- Quality Assurance Provisions for the boilerplate shall be in accordance with the applicable portions of NASA Bulletin NCP200-2.

4.2 Inspection and Tests.- Inspections and tests to determine conformance of the boilerplate to contract and specification requirements shall be conducted prior to submission of the boilerplate to NASA or in the presence of an NASA representative. Results of inspection tests on major components shall be submitted to NASA for review. Other acceptance test data relative to this specification shall be maintained and made available for review to NASA upon request.

5. PREPARATION FOR DELIVERY

5.1 Airborne Equipment.- Airborne Equipment shall be prepared for delivery in accordance with Specification SID 62-240.

5.2 Transportation.- The boilerplate shall be delivered to the local area testing site by the contractor.

6. NOTES

6.1 Definitions.- A boilerplate is a simulated spacecraft module for pre-developmental and/or developmental tests leading to the design of a prototype module.

Appendix I-A

Contractor-Furnished Equipment, Contractor-Installed

IMPACT ATTENUATION SYSTEM

Item No.	Quantity	Description	Part No.
1	7	Impact Air Bags, Large	
2	4	Impact Air Bags, Pillow	
3		Tension Straps	

Appendix I-A

Contractor-Furnished Equipment, Contractor-Installed

CREW SYSTEM

Item No.	Quantity	Description	Part No.
1	3	Anthropomorphic Dummies	
2	3	Seats	
3	3	Lock and Release Mechanism	
4	3	Restraint Harness and Mechanism	

Appendix I-A

Contractor-Furnished Equipment, Contractor-Installed

INSTRUMENTATION

Item No.	Quantity	Description	Part No.
1	15	Accelerometers	
2	16	Position Pickups	
3	18	Strain Gauges	
4	1	Wiring and Plugs	
5	1	Camera Installation	